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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LIOR SHABTAY and BENNY RODRIG

Appeal 2009-003351
Application 09/629,219
Technology Center 2400

Before KENNETH W. HAIRSTON, THOMAS S. HAHN, and BRADLEY W. BAUMEISTER, *Administrative Patent Judges.*

HAHN, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

Appellants invoke our review under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-17, 26-43, and 45-48. We have jurisdiction under 35 U.S.C. § 6(b). We affirm-in-part.

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

Appellants claim a switched communications network and a method for routing multicast information, i.e., packets addressed for delivery to selected destinations. Multicast information is communicated over Local Area Networks (LANs) having multiple virtual LANs (VLANs) using layer-2 and layer-3 switch/bridge units. The layer-2 level LAN is divided into a number of segments that is larger than the number of VLANs. A multicast detector identifies a group of the received packets that include Internet Group Management Packet (IGMP) queries, and these identified packets are prevented from being bridged through layer-2 switch/bridge ports that are not connected to a layer-3 switch or router. A layer-3 multicast routing table is created for each segment.[2] Independent claims 1 and 26 are illustrative:

> 1. A method of determining local multicast information of a local area network (LAN), comprising:
>
> dividing the LAN to a number of segments larger than the number of virtual LANs (VLANs) in the network; and
>
> creating a layer-3 multicast routing table, which relates to each of the segments separately.
>
> 26. A switch, comprising:
>
> a plurality of ports;
>
> a layer-2 bridging unit which bridges packets between the ports responsive to their destination MAC address and their VLAN; and
>
> a multicast detector which identifies a group of at least some of the IP multicast routing related packets received by the switch, the group

[2] *See generally* Spec. 9:13-18; 11:24-12:19; Fig. 2.

including IGMP queries, and prevents the layer-2 bridging unit from bridging the identified packets at least through ports which do not lead to at least one neighboring layer-3 switch or router.

The following prior art references are relied on for the appealed rejections:

Gleeson	US 5,959,989	Sep.28, 1999
Varghese	US 5,963,556	Oct. 5, 1999

The Examiner rejected:[3]

1. Claims 26, 28, 31-34, 38, 39, and 41-43 under 35 U.S.C. § 102(e) as being anticipated by Gleeson (Ans. 4-6);
2. Claims 1-17, 27, 29, 30, 35-37, 40, and 48 under 35 U.S.C. § 103(a) as being obvious over Gleeson and Varghese (Ans. 6-11); and
3. Claims 45-47 under 35 U.S.C. § 103(a) as being obvious over Gleeson (Ans. 11, 12).

I. ANTICIPATION

ISSUES[4]

Issues raised from Appellants' and Examiner's positions are:

1. For separately argued independent apparatus claim 26, from grouped claims 26, 28, and 31-34, does Gleeson teach the recited layer-2

[3] A rejection under § 101 of claims 1-13 (Office Action, mailed Mar. 7, 2007, ¶ 3) has been withdrawn (Ans. 2).

[4] Arguments that Appellants could have made but are not made are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

switching unit comprising a multicast detector (App. Br. 7; Reply Br. 4)?[5]

2. For separately argued independent apparatus claim 38, from grouped claims 38, 39, and 41-43, does Gleeson teach the recited layer-3 switch having (i) a VLAN interface without an associated IP router interface, and (ii) an output unit to direct IP packets that are Media Access Control (MAC) addressed to the switch through the VLAN interface (App. Br. 7; Reply Br. 5)?

ANALYSIS

Claims 26, 28, and 31-34

Appellants separately argue independent claim 26 by asserting that Gleeson fails to teach a layer-2 switching unit comprising a multicast detector because the reference discloses a multicast controller 306 (i.e., a multicast detector) that is *separate* from an intermediate device 221 (i.e., a layer-2 switch) (App. Br. 7). Responding to this assertion, the Examiner finds from Appellants' Specification that there are no "structural or physical limitations of the layer-2 bridging unit and multicast detector" that are taught as being "critical" (Ans. 13). Appellants dispute the Examiner's findings

[5] Appellants, at pages 3, 4 of the Reply Brief, assert new arguments for claim 26 that were not raised in the Appeal Brief. Consequently, issues from these new arguments raised for the first time in the Reply Brief are deemed to be waived. *See Optivus Tech., Inc. v. Ion Beam Appl'ns S.A.*, 469 F.3d 978, 989 (Fed. Cir. 2006) ("[A]n issue not raised by an appellant in its opening brief . . . is waived.") (citations and quotation marks omitted); *see also Fuji Photo Film Co. v. Jazz Photo Corp.*, 394 F.3d 1368, 1375 n.4 (Fed. Cir. 2005) (Arguments first raised in the reply brief but not properly raised in the opening brief are not addressed.).

and assert, without identifying any recited limitation, that there is a "claimed arrangement" for a layer-2 bridging unit and multicast detector (Reply Br. 3).

The structure that is recited by independent claim 26 is a "switch, comprising: a plurality of ports; a layer-2 bridging unit . . . ; and a multicast detector . . . ." We do not find these recitations providing narrowing structural or physical limitations beyond unspecified associations between the switch, ports, layer-2 bridging unit, and multicast detector. Accordingly, we find no error in the rejection under § 102(e) of independent claim 26 and dependent claims 28 and 31-34 as being anticipated by Gleeson.

Claims 27, 29, and 30

Appellants exclusively contend grouped claims 27, 29, and 30 are allowable for the reasons addressed *supra* for base independent claim 26 (App. Br. 12). Accordingly, we also will sustain the obviousness rejection of claims 27, 29, and 30.

Claims 38, 39, and 41-43

Appellants separately argue that independent claim 38 is patentable because Gleeson fails to teach a layer-3 switch having (i) a VLAN interface without an associated IP router interface, and (ii) an output unit to direct IP packets that are MAC addressed to the switch through the VLAN interface (App. Br. 7; Reply Br. 5). For the following reasons, we do not find Appellants' arguments compelling.

The Examiner finds Gleeson discloses a multicast network device (MND) 226 that is a layer-3 switching device having VLAN interfaces (Ans. 5). Further, the Examiner finds "MND 226 does not have an associated IP router interface" (Ans. 5). Appellants do not dispute that the Gleeson MND

226 is a layer-3 switching device with VLAN interfaces, but, instead, contend that "each of the VLAN interfaces of MND 226 . . . appears to have an associated IP router interface" (Reply Br. 5).

First, we find Gleeson is silent as to whether the disclosed MND 226 has a VLAN interface with an IP router interface. Appellants argue a double negative assertion that Gleeson does not disclose that the MND 226 has a VLAN interface without an associated IP router interface (*id.*). We understand this double negative to connote that Appellants are arguing that Gleeson MND 226 has a VLAN interface with an IP router interface. We are not persuaded by such an argument because we find the Gleeson silence is a fact that is consistent with the taught MND 226 having a VLAN interface without an associated IP router interface. In other words, the silence is a consistent fact with the absence of IP router interfaces from MND 226 VLAN interfaces.

Second, Appellants argue:

> Gleeson in FIG. 3 teaches that each of the[] logical VLAN interfaces 305 interfaces with trunk 231 over a common trunk/port physical interface 302. See Gleeson at column 9, lines 35-45. Thus, to the extent the MND 226 has an IP router interface with trunk 231, as argued by the Examiner, each of the VLAN interfaces of MND 226 identified and relied upon by the Examiner also appears to have an associated IP router interface.

(*id.*). Appellants assert that the Examiner argued "MND 226 has an IP router interface with trunk 231," but do not provide any citation to the record for this assertion. We are unable to find that the Examiner made such an argument, but instead we find the record shows the Examiner states "MND 226 does not have an associated IP router interface" (Ans. 5, 15). Further,

Appellants contend, without explanation as to reasoning, that Gleeson Figure 3 and associated disclosures somehow support finding that VLAN interfaces of MND 226 "appear[] to have an associated IP router interface." We do not find that Gleeson Figure 3 and associated disclosures explicitly or inherently teach VLAN interfaces having associated IP router interfaces.

The Examiner also finds:

> Gleeson discloses, referring to Figure 2A, MND 226, a type of layer-3 switch (router) that directs packets to the R, G, and B VLAN interfaces (See column 7, lines 57-59.) The MND 226 does not have an associated IP router interface. The distribution of messages also uses the MAC address derived from the IP destination address. The router (layer-3 output unit) forwards multicast IP packets with a source address corresponding to another host (IP source address associated with a different VLAN interface of the switch) through port 1 (VLAN interface) to host 33 (See col. 12, lines 36-44.)

(Ans. 15). In response, Appellants paraphrase the Examiner's findings, and then conclude, without citation to Gleeson's disclosures or explanation as to reasoning, that "with reference to [Gleeson] FIG. 3, messages that are passed to host 33 on LAN 236 are delivered via trunk/port physical interface 304, and thus are not directed to the host 33 through any one of the VLAN interfaces identified by the Examiner" (Reply Br. 5). Except for a bald citation to Gleeson Figure 3, Appellants provide no other basis from the reference to support concluding the Examiner's findings from Gleeson Figure 2A and cited disclosures are erroneous. We do not find evidence or rational reasoning in the record to support Appellants' conclusion, and concur with and adopt the Examiner's above-reproduced finding based on

Gleeson Figure 2A and cited disclosures. Consequently, we do not find this argument compelling.

For the foregoing reasons, we find no error in the rejection under § 102(e) of independent claim 38 and dependent claims 39 and 41-43 as being anticipated by Gleeson.

Claim 40

Appellants exclusively contend claim 40 is allowable for the reasons addressed *supra* for base independent claim 38 (App. Br. 13). Accordingly, we also will sustain the obviousness rejection of claim 40.

II. OBVIOUSNESS

ISSUES

Issues raised from Appellants' and Examiner's positions are:

3. For separately argued claim 1, from grouped claims 2-5 and 10-13, do Gleeson and Varghese alone, or in combination, teach or suggest the recited creation of a layer-3 multicast routing table that separately relates to segments, which are divided from a LAN and that outnumber VLANs in the network (App. Br. 8-10; Reply Br. 6-8)?
4. For separately argued dependent claim 9, do Gleeson and Varghese alone, or in combination, teach or suggest the recited connection of one or more hosts to a layer-3 switch or router (App. Br. 11)?
5. For separately argued independent claim 14, from grouped claims 14-17, do Gleeson and Varghese alone, or in combination, fail to teach or suggest the recited bridging of a received multicast packet through a

third physical port from a layer-3 switch (App. Br. 11, 12; Reply Br. 8)?

6. For separately argued dependent claims 35-37, do Gleeson and Varghese alone, or in combination, fail to teach or suggest the recited multicast detector preventing layer-2 bridging of packets, irrespective of packet IP or MAC addresses, or subscription information of hosts directly connected to the switch (App. Br. 12, 13)?
7. For separately argued dependent claim 48, do Gleeson and Varghese alone, or in combination, fail to teach or suggest the recited layer-3 multicast routing table used in a mode with interfaces identified by both a VLAN and a port (App. Br. 13, 14; Reply Br. 8, 9)?
8. For separately argued independent claim 45, from the grouped claims 45-47, does Gleeson fail to teach or suggest forwarding a packet with a changed MAC address and the same TTL value (App. Br. 14; Reply Br. 9, 10)?

ANALYSIS

Claims 1-5 and 10-13

Separately argued method claim 1 recites, *inter alia*, dividing a LAN into segments and creating a layer-3 multicast routing table that separately relates to each segment. The Examiner finds Gleeson teaches dividing a LAN into segments (Ans. 6, 7), and acknowledges Gleeson does not disclose the creation of a layer-3 multicast routing table that separately relates to each segment (Ans. 7). This subject matter the Examiner finds taught by Varghese (*id.*). Appellants disagree and contend "the Examiner has failed to identify a cogent motivation for combining the Gleeson and Varghese

references or modifying the reference teachings . . ." (App. Br. 9). The Examiner responds by reasoning it would have been obvious to an ordinarily skilled artisan "to implement the multicasting table of bridge ports of Varghese in the routing devices of Gleeson" (Ans. 18) because:

> One of ordinary skill in the art would have been motivated to do so in order to only transmit on bridge ports to hosts that are members of the corresponding multicast groups, thereby, reducing traffic flow and bandwidth as taught by Gleeson (See column 5, lines 27-40.) An added benefit of doing so would result in reduced network congestion and decreased costs due to lesser network traffic. In addition, unexpected results are not achieved.

(*Id.*)

Appellants acknowledge the Varghese VLAN table 144 is intended "to keep track of which sources are associated with which VLANs, and by implication which bridge ports, in a network bridge that associates different bridge ports with different VLANs" (Reply Br. 7). Appellants, however, conclude that "there appears to be no need for the VLAN table 144 of Varghese in the multicast distribution system of Gleeson" (*id.*). Accordingly, Appellants argue there is no motivation for combining or modifying the references, and more specifically Appellants conclude Gleeson's multicast distribution system does not need Varghese's table.

Addressing need, we turn to the Examiner's findings from Gleeson concerning traffic flow and bandwidth. Specifically, considering the Examiner's citation from Gleeson, we find the patent discloses that multicast messaging may subject a network to "substantial performance penalties," and, thereby, limit benefits from having established multiple VLANs (column 5, lines 37-40). Further, we find Gleeson discloses that "the

number of VLAN designations associated with a given group multicast address . . . may severely compromise the throughput on [a] trunk line" (column 5, lines 35-37). Consequently, we find Gleeson teaches an identified need to manage multicast messaging, i.e., realizing efficient traffic flow. Appellants acknowledge Varghese's VLAN table 144 keeps track of sources and VLANs. Based on this record, we find adequate rationale for combining references and modifying Gleeson to realize efficient traffic flow, i.e., an expected beneficial result. *In re Sernaker*, 702 F.2d 989, 994-95 (Fed. Cir. 1983).

In conclusion, we understand the Examiner's indication that "unexpected results are not achieved" to mean that combining Gleeson and Varghese does not produce unexpected results. Appellants neither contest nor submit contradicting evidence as to unexpected results.

For the foregoing reasons, we find no error in the rejection under § 103(a) of independent claim 1 and dependent claims 2-5 and 10-13.

Claims 6-8

Appellants separately argue these claims, which are dependent from base independent claim 1, by repeating the same argument asserted for claim 1 that Gleeson does not teach or suggest dividing a LAN into segments "for purposes of creating a multicast routing table which relates to each of the segments separately" (App. Br. 10, 11). Creating a multicast routing table that separately relates to segments is a limitation exclusively recited in base claim 1. Appellants' arguments for why Gleeson and Varghese fail to render claim 1 obvious are addressed *supra*, and are not found persuasive.

For the forgoing reasons, we also will sustain the rejection of dependent claims 6-8.

Claim 9

Claim 9 ultimately depends from base independent claim 1, and, *inter alia,* recites dividing VLANs into separate segments that "includ[e] a group of one or more links which connect one or more hosts to a router or layer-3 switch."

Appellants argue that the Examiner in relying on Gleeson "element 208 in FIG. 2A" erred in concluding the reference teaches or suggests the claimed limitation (App. Br. 11). The Examiner did not respond to Appellants' argument (*see* Ans. 18 where claim 9 is listed but Appellants' argument is not addressed).

Turning to the rejection, the Examiner reports finding Gleeson's LAN "208 in Fig. 2A . . . connects 3 hosts in the Green VLAN to *layer-3 switch 221*" (Ans. 9 (emphasis added)). We find Gleeson discloses that LAN hosts (labeled "H") are connected to switches or hubs, such as intermediate device 221 (column 7, lines 53-56). Consistent with this disclosure, however, the Examiner repeatedly indicates finding intermediate device 221 to be a layer-2 switch or bridging unit and not a layer-3 device (e.g., *see* Ans. 4 and 9 where the Examiner finds Gleeson intermediate devices 220-223 to be layer-2 switches and MNDs 226 and 228 to be layer-3 switches, citing column 7, lines 50-59). The Examiner nowhere indicates a finding or rationale for why or when intermediate device 221 should become a layer-3 switch or router.

For the forgoing reasons, we are persuaded by Appellants' argument that the Examiner failed to find a layer-3 switch, so we will not sustain the rejection of claim 9.

Claims 14-17

Separately argued independent method claim 14 recites, *inter alia*, a "multicast packet is bridged in layer-2 through a third physical port of the layer-3 switch." Appellants argue there is no Gleeson disclosure with respect to this recited limitation (App. Br. 11).

Referencing Gleeson, the Examiner responds that a "packet is bridged through port 1 of the layer-3 router 226 (the multicast packet is bridged in layer-2 through a third physical port of the layer-3 switch) (Referring to Figure 2A, see column 12, lines 36-38 and column 18, lines 53-64.)" (Ans. 19). Accordingly, the Examiner finds Gleeson MND 226 is a layer-3 switch with a third physical port. Appellants disagree, and assert "MND 226 as disclosed in Gleeson only appears to include two physical ports, denoted 1 and 2 in FIGS. 2A and 3" (Reply Br. 8). We are persuaded by Appellants' assertion because we also find Gleeson Figure 2A shows MND 226 as only including ports 1 and 2. We do not find Gleeson teaches or suggests the Examiner relied on layer-3 switch MND 226 as including more than two ports.

For the forgoing reasons, we find error in the rejection under § 103(a) of independent claim 14 and dependent claims 15-17 that incorporate the disputed limitation.

Claims 35-37

Appellants separately argue claims 35-37, which depend from base independent claim 26. These dependent claims add recitations that the claim 26 multicast detector "prevents the layer-2 bridging of packets, irrespective of" (i) the IP destination address of the packets (claim 35), (ii) the MAC

destination address of the packets (claim 36), and (iii) subscription information of hosts directly connected to the switch (claim 37).

Appellants contend Gleeson and Varghese alone, or in combination, fail to teach or suggest a multicast detector preventing bridging packets irrespective of IP or MAC destination addresses, or host subscription information (App. Br. 12, 13). The Examiner indicates reliance on the final rejection (Ans. 19; *see* Final Action, mailed Mar. 7, 2007, p.10), and further explains:

> [T]he modified version of Gleeson teaches that the bridging capabilities will prevent certain packets from being forwarded, because Gleeson's switch will not forward multi-cast packets to unintended VLAN IDs regardless of their IP/MAC/host subscription information (logically equivalent to an IP or MAC address) destination address (See column 10, lines 22-33 and column 13, lines 6-18.) Therefore, Gleeson teaches *a multicast detector which prevents the layer-2 bridging of packets, irrespective of the IP destination address of the packets.*

(Ans. 20.) Appellants do not address this explanation by the Examiner.

We also find Gleeson teaches layer-2 device 221 preventing messages being forwarded due to dissimilarities in VLAN designations between messages and corresponding ports, i.e., unintended designations (column 13, lines 6-18). Accordingly, we find the Examiner's position to be rational and not to be in error.

For the forgoing reasons, we will sustain the rejection of claims 35-37.

Claim 48

Separately argued independent claim 48 covers a switch comprising, *inter alia*, a multicast routing unit that routes packets based on a layer-3 multicast routing table "wherein the layer-3 multicast routing table may operate in a first mode in which interfaces are identified by both a VLAN and a port or in a second mode in which interfaces are identified only by a VLAN." The Examiner finds "Varghese teaches two methods of operation, one in which both the VLAN and port are identified (See column 8, lines 15-19) and one in which the source addresses for each VLAN is utilized (See column 7, lines 35-36.)" (Ans. 7).

Appellants do not dispute Varghese discloses a source VLAN table 144 (App. Br. 13). Appellants also do not dispute that Varghese utilizes VLAN addresses for one method of operation and alternatively VLAN and port addresses for another method of operation (*id.*). Instead, Appellants assert that for the method employing VLAN and port addresses "Varghese[] apparently does not make use of the source VLAN table 144" (*id.*). The Examiner disputes Appellants' contention and relies on Varghese disclosures at column 8, lines 15-19, for teaching a method of operation "in which both the VLAN and port are identified through association" (Ans. 20).

Claim 48 recites, *inter alia*, that "the layer-3 multicast routing table may operate in a . . . mode which interfaces are identified by both a VLAN and a port." We find Varghese discloses using two methods for switching (column 7, lines 19-33). One of the methods utilizes a forwarding database 146 with maps of ports to VLANs that is information maintained in a source VLAN Table 144 (column 8, lines 6-19). Accordingly, we find the Examiner's position not to be in error.

For the foregoing reasons, we will sustain the rejection of claim 48.

Claims 45-47

Separately argued independent method claim 45 recites, *inter alia*, "receiving a packet with a source MAC address and a [time-to-live] TTL value; . . . and forwarding the packet with [a] changed MAC address but with the same TTL value."

The Examiner finds Gleeson teaches all limitations except for forwarding the packet with the same TTL value (Ans. 11, 12). The Examiner reasons an ordinarily skilled artisan would be motivated to maintain the same TTL value "in order to implement a router with a greater effective hop count limit to increase the effective propagation range of a datagram for communication with distant devices as consistent with conventional routing functions as taught by Gleeson" (Ans. 12). The Examiner further indicates that maintaining the same TTL "is a conventional and traditional method of IP packet forwarding" (Ans. 21).

Appellants argue that Gleeson fails to teach the disputed limitation (App. Br. 14), and further assert:

> The language in Gleeson does not support the argument of the Examiner to the effect that forwarding without changing the TTL value is another conventional technique that may be used. Gleeson makes no teaching or suggestion whatsoever regarding forwarding without changing the TTL value. The Examiner states that such forwarding is "[i]n accordance with traditional routing functions," but there is no support at all in Gleeson for this position. The Examiner appears to be attempting to argue prior art that is not of record, which is clearly improper.

(Reply Br. 9, 10).

The Examiner has acknowledged Gleeson fails to teach the disputed limitation (Ans. 12). We do not find Gleeson teaches or suggests forwarding a packet with an unchanged TTL, and we do not find evidence to support the Examiner's conclusion that such packet forwarding is in accordance with traditional routing functions.

Accordingly, in order for us to sustain the Examiner's rejection on this record, we would need to resort to impermissible speculation or unfounded assumptions or rationales to supply deficiencies in the factual bases of the rejection before us. *In re Warner*, 379 F.2d 1011, 1017 (CCPA 1977).

For the forgoing reasons, we find error in the rejection under § 103(a) of independent claim 45 and dependent claims 46 and 47 that incorporate the disputed limitation.

ORDER

The Examiner's decision rejecting claims 1-8, 10-13, 26-43, and 48 is affirmed. The Examiner's decision rejecting claims 9, 14-17, and 45-47 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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